GENERAL INSTRUCTIONS
TEN-TEC TRITON IV ACCESSORIES

Service Note SN-1-540

When using TRITON IV accessories that plug into the ACCESSORIES socket on the rear panel of the unit, several procedures should be followed, especially when more than one accessory are used in the station set-up. The order in which the accessories are serially connected, and the required jumpers and their location, be it on a dummy plug or in one of the cable connectors, are outlined below for all possible combinations. Accessories requiring these procedures are:

Model 240 One-Sixty Converter
Model 241 Crystal Oscillator
Model 242 External VFO
Model 244 Digital Readout

In order to simplify these procedures and instructions, it is recommended that the VFO modification detailed below be made, even though the external VFO, Model 242, is not incorporated at this time. This modification will not affect the operation of any other accessory, provided that the jumpers in the accessories used are changed to agree with the information given in this Service Note. TRITON IVs with Serial Numbers greater than 1400 already have this modification.

VFO MODIFICATION

This modification is necessary when using the external VFO, Model 242, so that the instant break-in feature of the TRITON system is maintained. Even though Model 242 may not be used at this time, performing the modification now will eliminate further alterations to the jumper positions in the future, and will bring TRITONs with S.N. below 1400 up to present day status. Modified units should be so noted by applying the adhesive label supplied to the TRITON rear panel near the ACCESSORIES socket.

1.) Remove top and bottom plates from TRITON IV.

2.) Remove SSB GEN. assembly, 80282, and bend fibre insulator up to expose cables underneath.

3.) Unsolder the three red wires that are attached to the thru-terminal on the right top side of the VFO compartment. This terminal is the one farthest to the rear of the TRITON and is the +12 volt line.

4.) Locate the one red wire that runs to the 47 ohm resistor on the terminal strip near the meter lamp. Clip this wire from the resistor.

5.) Work the remaining two wires back through the harness ties to where they emerge from under the CONTROL BOARD assembly.

6.) Twist these two leads and dress them to the 47 ohm resistor lug just mentioned. Solder.

7.) Unsolder the orange lead from the center VFO thru-terminal and resolder it to the one that had the three red leads. (This lead goes to pin 5 of the ACCESSORIES socket.)

8.) Take the discarded red lead and solder it between the center thru-terminal on the VFO compartment and the second terminal lug from the right on the front PC socket for the SSB GEN. assembly. This lug is the + regulated line and should already have an orange and a white lead in place.

9.) Lay fibre insulator back down and replace SSB GEN. assembly.

10.) Remove top plate of VFO compartment.

11.) Locate and remove red wire running from rear thru-terminal to PC assembly inside of compartment.

12.) Solder one millihenry choke between these two points. Replace top and turn TRITON over.

13.) In bottom section of VFO compartment locate and unsolder white wire going to wafer switch mounted on rear inside compartment surface.

14.) Resolder this lead to the solder dot on the center switch wafer immediately opposite the lug just vacated. In other words, transfer this lead from the rear wafer to the corresponding lug of the center wafer.

15.) With a piece of bare hook-up wire about 3/4" long, jumper the vacated lug on the rear wafer to either adjacent lug with green leads already attached. Turn TRITON right side up.

Due to the added current drain through pin 2 of the ACCESSORIES socket when several accessories are used, the voltage drop and power loss of L1, the small choke in series with the +12volt line may become excessive. The following steps rewire the circuit so that pin 2 of the socket goes directly to the power supply line instead of through L1.

16.) Locate the red lead going from pin 2 of the ACCESSORIES socket to the top lug of the four lug terminal strip mounted on the chassis side near the socket. Unsolder only this lead at the terminal lug location.

17.) Resolder this lead to the fuse post body terminal, the one with the heavy red lead going to the final amplifier assembly.

18.) Again referring to pin 2 of the ACCESSORIES socket, locate the second red lead soldered to it -- the one going through the chassis grommet to the bottom side of the chassis. Unsolder only this lead from pin 2 and feed it back through the cable tie to gain additional free length.

19.) Re-route the lead under the socket to the top lug of the terminal strip and solder.

20.) Replace top and bottom plates. Affix label noting mod. change to rear panel.

21.) If dummy plug for socket has jumper between pins 4 and 5, remove and jumper pins 2 and 5.

NOTE: To determine whether an existing TRITON IV has the VFO modification, slide back the top plate and note the wires going to the VFO thru-terminals. If a single orange lead is connected to the rear-most terminal, the modification has been made. If there are three red wires at this terminal, the modification has not been made.

IT IS VERY IMPORTANT FOR PROPER VFO OPERATION THAT PINS 4 AND 5 OF DUMMY PLUG BE JUMPERED IF MODIFICATION IS NOT INCORPORATED AND PINS 2 AND 5 IF MODIFICATION IS MADE. FAILURE TO COMPLY WILL RESULT IN UNSTABLE VFO PERFORMANCE.

INTERCONNECTING ACCESSORIES

The table below shows all possible accessory combinations that are workable as a system, the jumpers required and their location. When two or three accessories are used together, serially connect them in the same order as listed. Models 241 and 242 and Models 241 and 244 cannot be used together.

3 mods

IMPROVING THE DYNAMIC RANGE OF THE MODEL 540/544

Good Mod.

Modifications to be performed on the TX/RX-MIXER BOARD 80287

Component	Old Value	New Value or Action To Be Taken
C2		REMOVE
R2	100 ohms	150 ohms
R6	470 ohms	1500 ohms
R7	470 ohms	820 ohms
R3	2.2K ohms	10K ohms
C20		REMOVE

"S" Meter calibration will be slightly low, but sensitivity will not be impaired.

TN-3-540

SUBJECT: FSK into Model 540/544

PARTS:
1 - 500 K trimpot
1 - 1 K resistor
1 - 47 K resistor
1 - MPSL51, 2N5807, or any small signal silicon PNP transistor

PROCEDURE:

1.) Using a small PERF board, wire switching transistor and trimpot as shown below.

2.) Remove top cover of transceiver and locate CONTROL BOARD.

3.) Connect lead from "A" to +REG lug of terminal strip.

4.) Connect lead from "B" to junction of R16 and R17 as shown below.

5.) Add phono jack to rear chassis (or disconnect sidetone jack) and connect lead from "C". This is the FSK line.

6.) Connect a frequency counter to VFO output at Pin 6 on rear panel accessory socket.

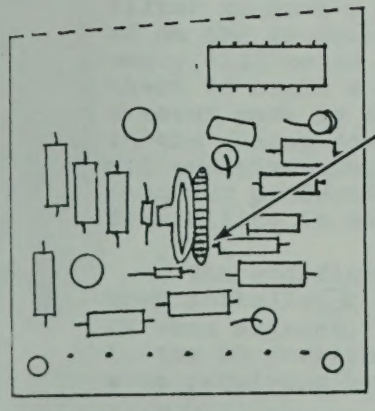
7.) Place MODE switch in LOCK position and note frequency.

8.) Ground FSK line and adjust trimpot for a shift of 170 Hz higher.

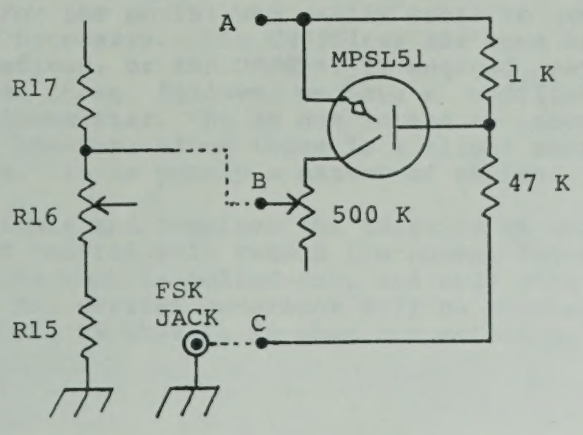
OPERATION:

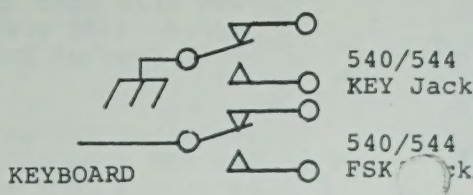
For FSK RTTY operation, place MODE switch of 540/544 in CW-1 or CW-2 position. In the receive position, the offset function will operate normally. In the transmit position, the carrier will be turned on, and the keyboard will key the FSK switching transistor.

For RTTY operation, you will find it convenient to mount a DPDT switch for transmit/receive functions as shown below.



80280 CONTROL BOARD
FRONT





TEN-TEC

QTC

SEVIERVILLE, TENNESSEE 37862

TN-I-540 TEN-TEC TECH NOTE 11-76

To: All TRITON IV Owners

Subject: Zero beating TRITON IV to incoming CW signal. A modification that you may want to make.

Many times there is more than one way to accomplish a given objective. A case in point is the method of tuning a transceiver on CW so that the transmitted signal is on the same frequency as the incoming signal.

In the case where separate transmitter and receiver units are used, it is an easy matter to turn the exciter portion of the transmitter on and match both carriers in the receiver. With transceivers, this is an impossibility because both sections cannot function simultaneously, having some portions common to both. It wouldn't be a problem except for two reasons. First, the incoming signal, to be heard, must be tuned off the zero beat point so that an audible signal is produced. Second, when a single crystal filter is used to develope the SSB signal for both transmitter and receiver (where the carrier frequency is well down one side of the passband characteristic), it is necessary to shift the CW carrier up this skirt so that it is well within the filter passband.

Early model SSB/CW transceivers neglected to take into account these factors, and the "leap-frogging" phenomenon was prevalent. Offset or incremental tuning solved this problem, but the method of tuning in the station to the desired beat note varied, depending on the scheme of developing the CW carrier used. In TRITON, we shift the 9 MHz carrier generator 750 Hz up into the passband of the filter when transmitting CW, and back down to the skirt when receiving. If we did not go down the skirt, the received signal would have audible beats on either side of the zero point -- a condition that not only causes confusion when tuning in a station as to what is the correct side to have the transmitter correct, but also causes twice the QRM problem. An interferring station may be on either of two sides of zero beat instead on one. With this scheme, the transmitter will be set to the incoming frequency whenever the received signal is set to a 750 Hz beat, provided that no receiver offset is involved. If it is, no telling what the transmitted frequency is.

To make setting of the beat to 750 Hz easier, we designed our Model 245 CW filter to have a passband centered at 750 Hz. Therefore, when the S-meter is peaked on the incoming signal, and OFFSET is disabled or centered, the transmitter frequency will be on target. For the purist who really wants to get exactly on frequency, there is still a judgement necessary. The CW filter has some bandwidth where the S-meter peak is not well defined, or the OFFSET, if engaged, may not be set exactly to the center position. For these fellows, we have a modification that will permit exact setting of the transmitter. We do not intend to incorporate this change into our production units, however, since there is a slight sacrifice in control flexibility in another area. It is purely a matter of choice.

The modification is simple and requires the addition of only one 10K resistor. When installed the OFFSET control will retain its normal function in both SSB and CW when engaged, but when the knob is pulled out, and only when the MODE switch is in the CW positions, the 9 MHz carrier generator will be shifted into the passband when receiving by the same 750 Hz that it is when transmitting. With this shift,

the receiver will now show beat notes on either side of zero beat so that the incoming signal can be set to zero beat easily. And, because this shift is now present in both receive and transmit modes, the transmitted frequency will be as close to the incoming frequency as you can set the zero point. (When using this circuit, you will automatically disable any possible receiver offset error, since the OFFSET control has to be pulled out to attain these conditions.)

To make the modification, proceed as follows:

1.) Remove top from TRITON IV.

2.) Remove all screws from bottom plate except those holding the speaker bezel and snap-down legs. The bottom can then be slid back several inches -- all that is necessary.

3.) Remove CONTROL BOARD. Position TRITON in front of you so that it is upright and with front panel toward you. CONTROL BOARD should then be to the right side of the unit. Turn back fishpaper so that sockets are exposed.

4.) Clip one lead of a 10 K resistor to 3/8" length and solder this lead to the third lug from the left on the CONTROL BOARD socket nearest to you. This lug should already have a solid grey and a grey/white stripped lead.

5.) Clip the remaining resistor lead to 1/4" and solder a 10" length of hook-up wire to it.

6.) Using a 1" length of 1/8" diameter plastic tubing (plastic soda straw is OK), slide it over free end of wire and all the way over resistor and solder splice. Dress resistor down to chassis and free end of wire through hole in chassis under panel meter, and over to MODE switch location.

7.) Replace CONTROL BOARD.

8.) Locate small transistor wired to lugs on rear deck of MODE switch. Note that there is a 10K resistor soldered to center (base) lead. Trim any excess length from hook-up wire, strip end 1/8" and tack solder it to this junction. It is suggested that the wire be soldered to the resistor portion of the lead and not to the transistor lead.

9.) Slide back bottom plate and insert screws.

NOTE: This modification in no way affects the operation of the TRITON IV on sideband. The normal tuning procedure is to tune in the station for the most natural tone quality with OFFSET either centered or off. The transmitter will then be on the same frequency. HOWEVER, be aware that if you tune a CW signal in the SB-N position, or a sideband signal in the CW-2 position, the tuning system reverts to the normal TRITON system in the first case, and is not correct in the second. If cross mode positions are used, make sure that OFFSET control is engaged.

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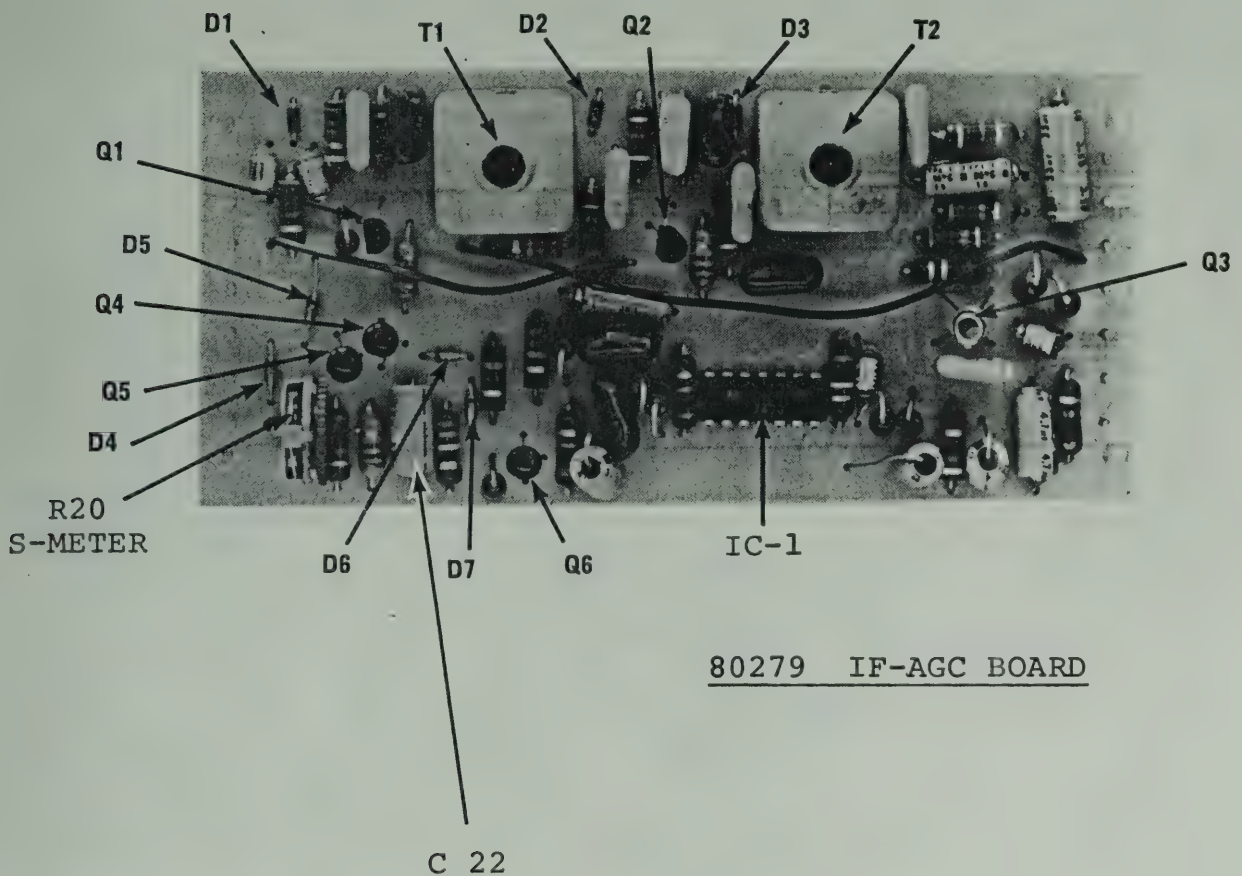
ALTERING THE AGC IN THE 540/544



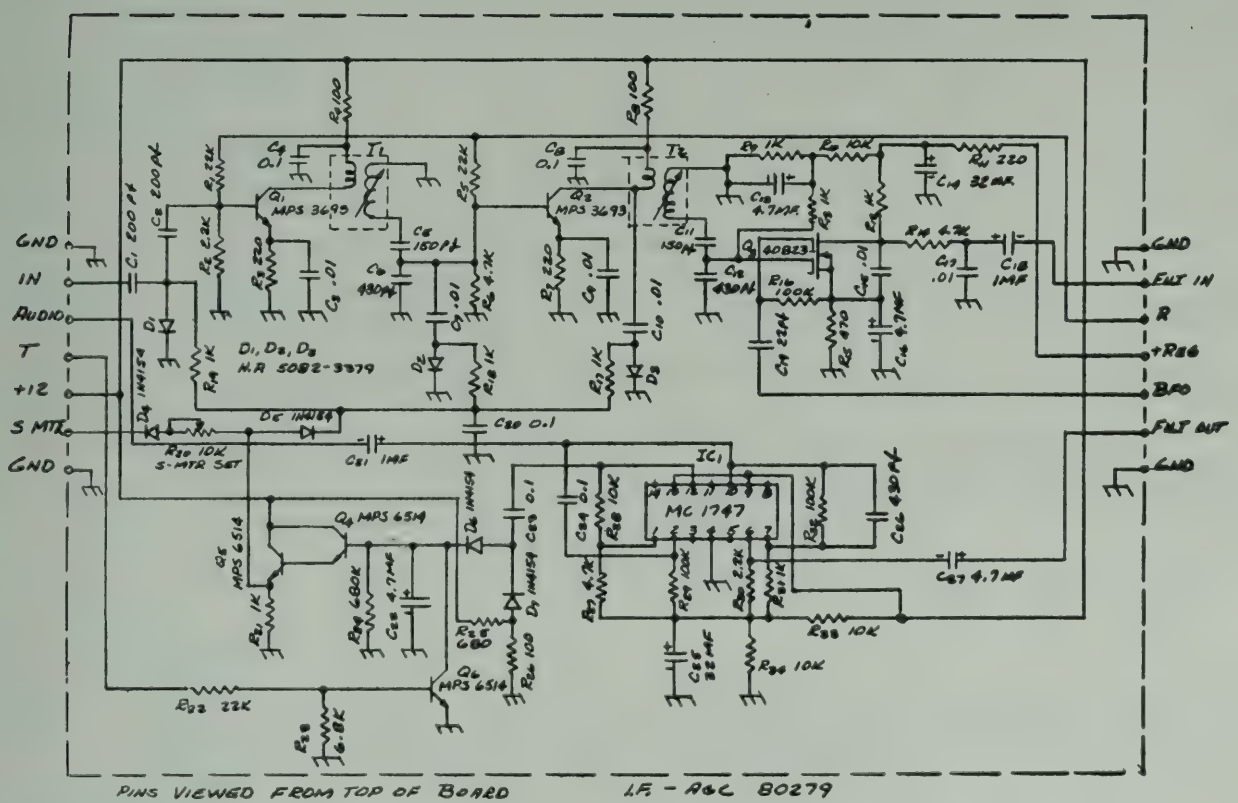
80279 IF-AGC BOARD

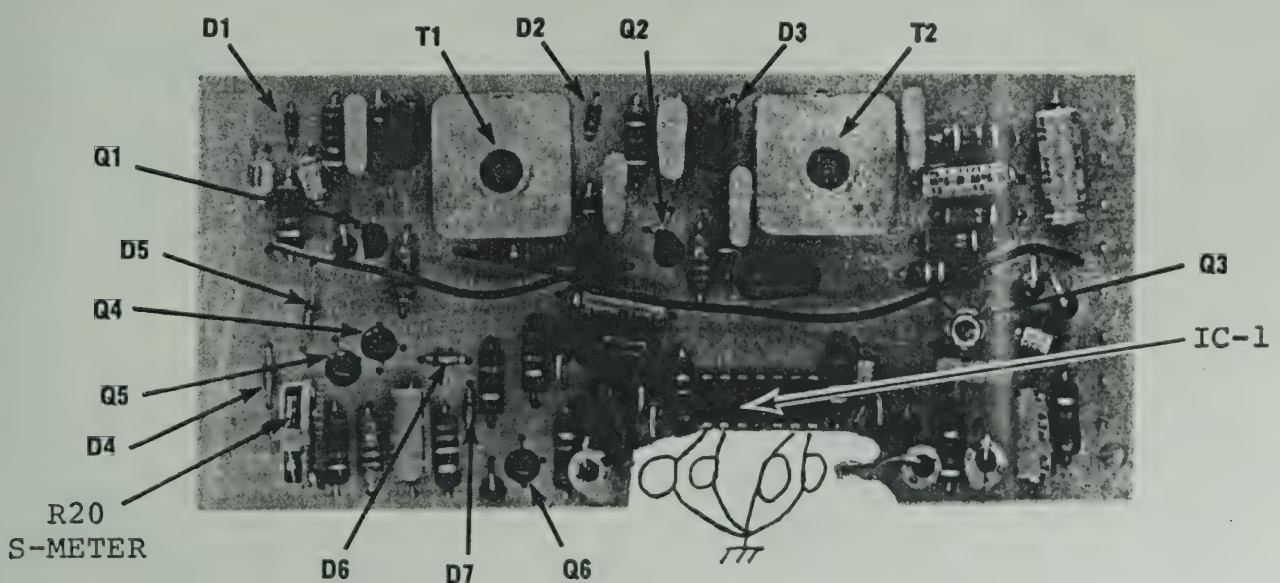
DECREASE RELEASE TIME: reduce value of C 22 on IF BOARD 80279 to 2.2 or 3.3 ufd

ON/OFF CONTROL OF AGC: install a single pole, single throw switch across C22 to ground

ATTENUATING VHF INTERFERENCE IN MODEL 540/544

Connect a .001 ufd capacitor from PINS 1,2,6,7 of IC-1 to ground as indicated. All wiring to be done beneath board.





80279 I.F.-AGC

TEN-TEC

QTC

SEVIERVILLE TENNESSEE 37862

TN-2-540
Subject: FSK into Model 540/544

PARTS

small 100 K trim pot
mercury wetted (fast) contact relay: CLARE #HGSR51111MØØ
small diode

PROCEDURE

1.) Remove top cover of 540/544 and locate CONTROL BOARD.

2.) Mount relay vertically on panel behind CONTROL BOARD.

3.) Mount trim pot for easy access to COMMON terminal of relay and connect in series to ground.

4.) Solder wire to junction of R15 and R16 and connect to either NO or NC contact of relay.

5.) Connect one side (+) of relay coil to +12 VDC on CONTROL BOARD. Opposite coil terminal is the FSK line which is brought to unused phono jack on rear apron of 540/544. Any unused phono jack on the rear apron may be disconnected and used as the new FSK jack.

6.) Connect small diode across the relay coil terminals, cathode to +12 VDC.

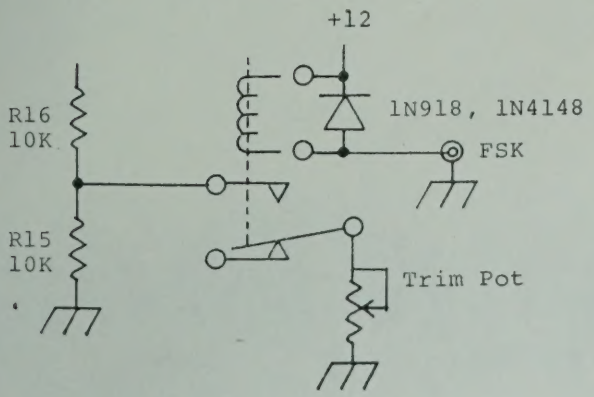
ADJUSTMENT

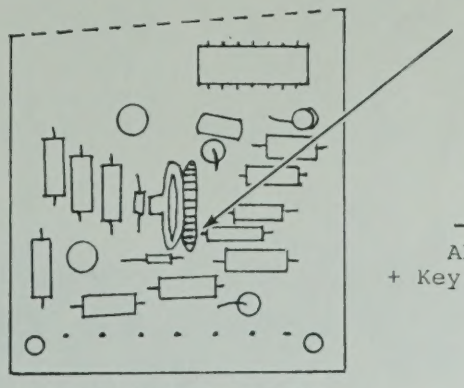
To adjust for proper 170 Hz shift, obtain frequency counter and connect to TX VFO output found at Pin 6 of the rear panel ACCESSORY socket. Place front panel MODE switch on LOCK. With FSK line ungrounded, note VFO frequency. Now, ground FSK line and adjust trim pot for 170 Hz offset.

For your convenience, install a RX/TX switch DPDT on rear apron of AKB-1 keyboard.

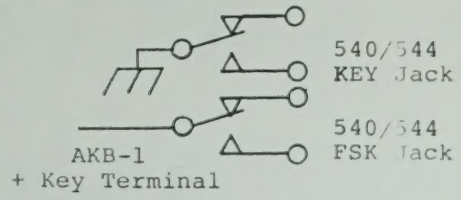
OPERATION

For FSK RTTY operation, place MODE switch of 540/544 in CW mode. In the receive position, the normal OFFSET function will be inoperative. In the transmit position, the carrier will be turned on with capability of FSK RTTY operation. If shift is in wrong direction for band in use, connect wire from junction of R15 and R16 on CONTROL BOARD to opposite relay terminal (NO/NC), or simply enable the REVERSE SHIFT switch on AKB-1 keyboard.





80280 CONTROL BOARD
FRONT



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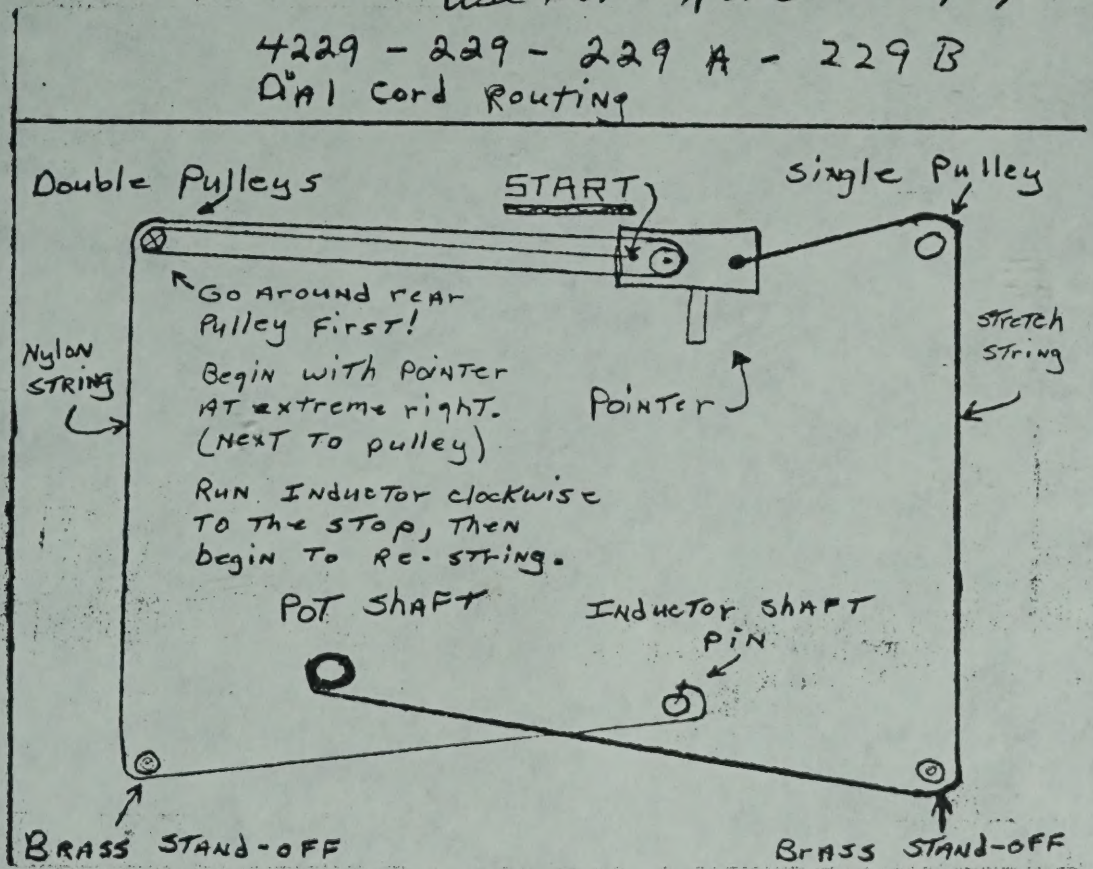
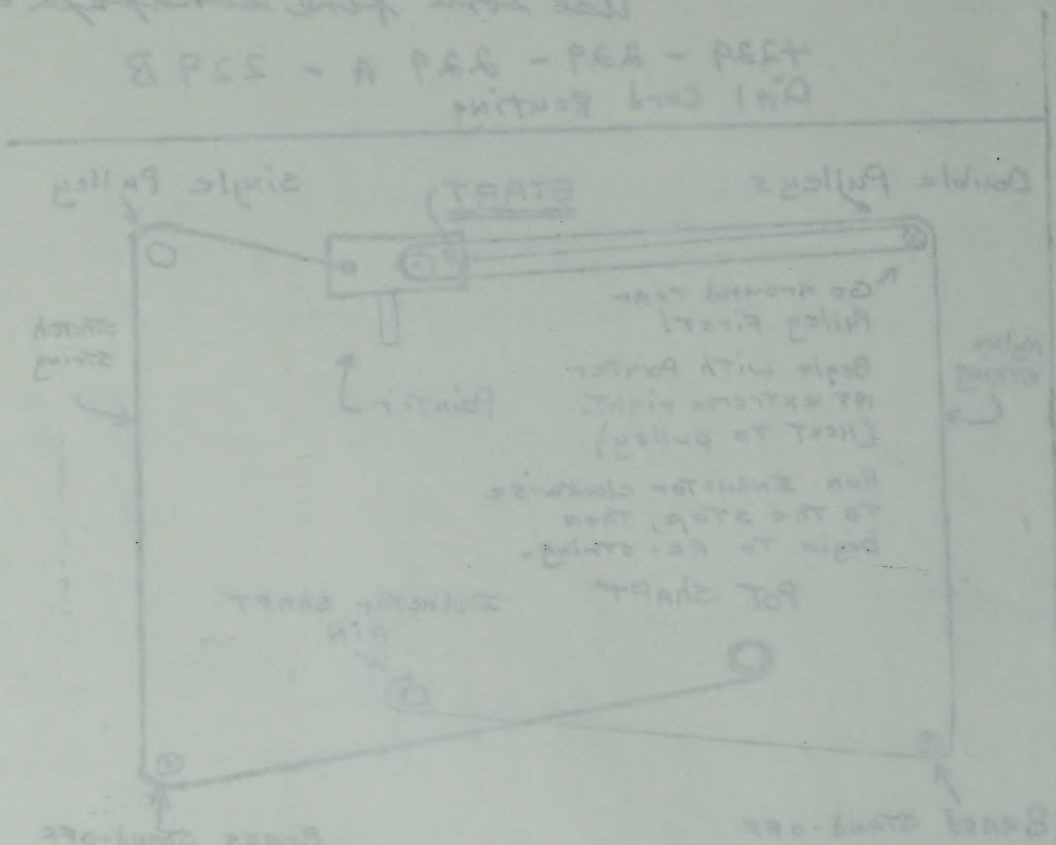
Dr. [redacted]
Try replacing the dial cord first. & also check for "burr" on the sub-panel. you may need to use some fine sandpaper on it.

4229 - 229 - 229 A - 229 B
Dial Cord Routing